Datenstrukturen & Algorithmen

Exercises.

1) Provide a sequence in which the vertices of the following graph are visited during a breadth-first search (BFS) starting at A, and a sequence in which the vertices are visited during a depth-first search (DFS) starting at A. The neighbors of a vertex are visited in alphabetical order.

```
A
|   |
|___|
B   C   D   E
```

BFS: _______________________

DFS: _______________________

2) Mark the first three edges in the following graph that are added to the minimal spanning tree by the algorithm of Jarník, Prim, and Dijkstra starting from vertex A.

```
A
|   |
|___|
B   C   D   E   F
```

3) Specify an order for the functions below such that the following holds: If function f is left of function g, then \( f \in O(g) \).

\( (\sqrt{n}), \log^2(n), n \cdot \sqrt{n}, n!, \log(n^5), 7^{13}, \log(n^n), \sqrt{6^n} \)
4) Draw the binary search tree that has postorder traversal 4, 7, 6, 10, 11, 9.

5) Specify (as concisely as possible) the asymptotic running time of the following code fragment in \( \Theta \) notation depending on \( n \in \mathbb{N} \). You do not need to justify your answer.

```java
for(int i = 1; i < n; i++) {
    for(int j = n; j >= 3; j /= 3)
        ;
}
```